

INVERTER TESTER

Equipment for testing and
diagnostic of the
FUJITSU-GENERAL
inverter split systems

USER MANUAL

99900 CMTESTER – Tester for DC compressors

99906 DC-MOTOR checker - Tester for DC fan motors

99905 STEPPER MOTOR checker – EEV Stepper Motor and Louver motor Tester

99513 COMMSIM - Simulation of indoor and outdoor units, monitoring of commun.

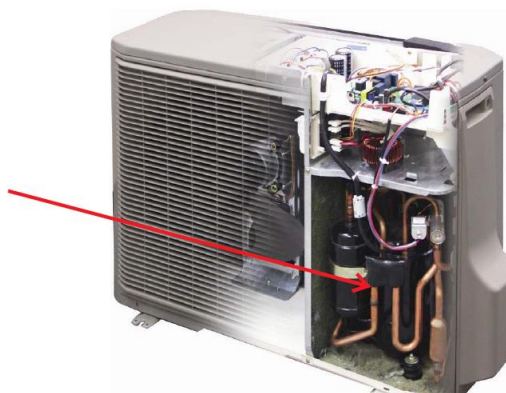
99800 COMTEST - Tester of correct unit wiring and their communication

99318 LOGGER – Recording device for communication data

99720 UPG Cable – Usb Data cable for software upgrade of inverter tester modules

CMTESTER – Tester of DC compressors

Functional testing of inverter DC compressors



Preparation for testing:

- Disconnect the cables of the compressor motor from the outdoor unit PCB.
- Use an ohmmeter (with a range of megaohms) for checking possibility of short circuit or leakage between the connector contacts and the motor frame. All values must be outside of top of the range of the ohmmeter. Otherwise, the motor is defective. Do not continue with testing, the tester could be damaged.
- Check the resistance between the motor leads with ohmmeter. The value of resistance of the motor winding can be, depending on the compressor, in the order of tenths to whole Ohms. It is essential that the resistance of all winding showed the same value. If any value is significantly different, the engine is defective. Do not continue with testing, the tester could be damaged.
- Connect the power cord lead to the 230VDC power supply of the tester, fused at least with 16A circuit breaker. The switch "POWER" must be in position "O", switch "TEST" in position "STOP" and the desired speed of compressor must be set by switch in position "LOW"
- Connect the cable of the tester to the three connectors of compressor windings and ground clamp to the frame or chassis of the outdoor unit.

Test of the compressor

1. Turn on the tester by switch "POWER"
2. After pressing the "TEST" switcher, the compressor will start and its speed is gradually increasing from zero to 50% of the maximal speed. LED "Status" during the test alternate between red and green.
3. The running compressor please do check by hearing in case that shows any unusual noises.
4. After the test of the compressor stops the final result is indicated by LED "Status"

continuous green light ... compressor is OK

red flashing ... compressor is faulty (detailed errors identification - see Table)

green flashing ... checker error (detailed errors identification - see Table)

In case of a positive test result from position "LOW", the test can be repeated again with a speed switch in position "HIGH". This mode will increase speed gradually up to the maximum of 100%.

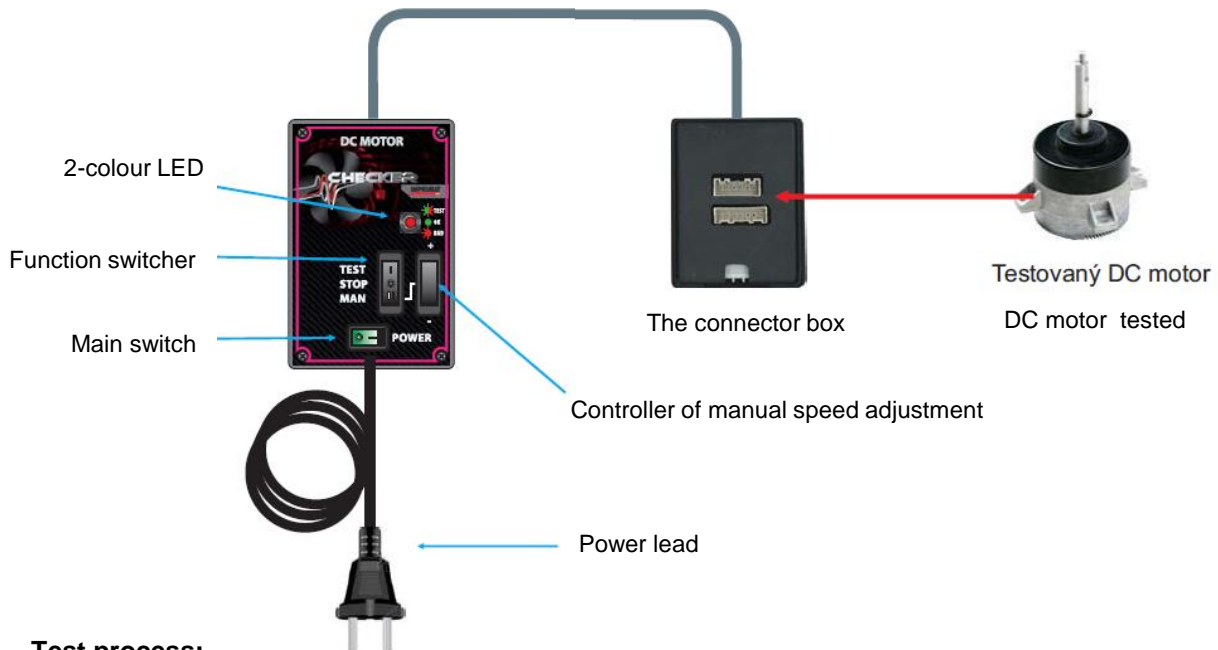
ATTENTION! Before each repetition of the test is necessary wait at least three minutes until the pressures in the refrigerant circuit gets balanced again!

CMTESTER – Tester of DC compressors

LED flashes alternately RED and GREEN	The test is running
GREEN lights continuously	The compressor is OK
RED flashes	ERROR of the compressor : 2x it's not possible reach the maximum rotor speed 3x power currents asymmetry of phases - different winding resistances 4x winding insulation resistance to ground <1MOhm 5x supply current limit exceeded 6x compressor spin failed
GREEN flashes	ERROR of the Tester: 2x DCbus low voltage +350 V (less than 300V) – check the power supply of the tester 3x high temperature of heat sink – please leave the tester cool down
RED flashing rapidly	Firmware of tester is faulty – upgrade was not succesfull. In this case it is necessary to repeat the upgrade again (see chapter - UPG cable).

DC MOTOR TESTER

Functional testing of DC fan motors of indoor and outdoor units



Test process:

- Turn off the power to the unit and wait a few minutes for the power supply capacitors to discharge.
- Disconnect the DC motor connector from the control PCB of the unit.
- Turn the rotor of the fan by hand. If you can feel a significant resistance, the motor is faulty. In that case, do not continue testing, the tester could be damaged.
- Use an ohmmeter (with a range of megaohms) for checking possibility of short circuit or leakage between some of the motor leads (red, black, white) and the motor frame. All values must be outside of top of the range of the ohmmeter. Otherwise, the motor is defective. Do not continue with testing, the tester could be damaged.
- Use an ohmmeter to check the resistance between each motor power connections (red, black, white) - must not show measurable resistance. Otherwise, the motor is defective. Do not continue testing, the tester could be damaged.
- Connect the motor to the tester. During the connecting, the tester must be switched off by main switch and the function switcher in position 0!

CAUTION

Connect the motor connector to the mating connector in connector box. Attention! Connectors of certain engine types have colors connected in reverse order. Make sure that the color of cable wire match the color marking of engine connector, otherwise the engine and the tester can be damage.

AUTO test

Turn on the main switch and then the function switcher to TEST mode. The motor spins continuously and then reduces speed to zero. During the test, the LED flashes red and green alternately. Check if the engine does not have vibration, or unusual noises. If the LED after the test is lit solid green, the engine is electrically fine. If the LED is on or flashing red, the engine is faulty.

If the automatic test is successful, the engine can be tested in a manual mode.

MANUAL test

Change the function switcher to MAN. In this mode, you can increase or decrease the speed by control manual settings. Test the motor gradually throughout of his speed range. If the engine does not respond correctly, or LED lights up red, the engine is defective.

WARNING

- During the test the engine must be properly to avoid personal injury or material damage.
- And also do not touch the connectors! There is high voltage and a danger of electric shock.
- Tester may use only competent person which is able to work with electrical equipment.

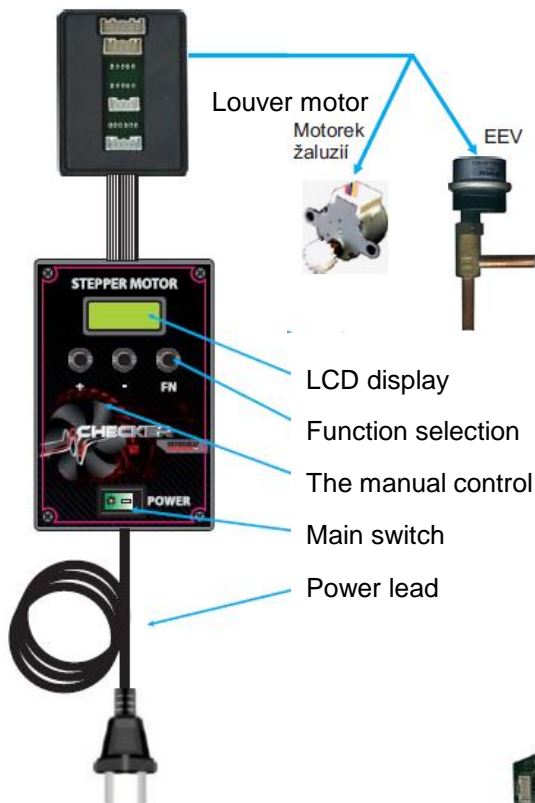
CAUTION

The engine must be loaded during the test, if possible with the original fan rotor (propeller). Unloaded motor may (depending on type) show during acceleration twitching, irregular operation, vibration or engine can be evaluated by tester as faulty.

STEPPER MOTOR TESTER

Functionality testing of motors of electronic expansion valve (EEV) and also the louver stepper motors.

The connector box

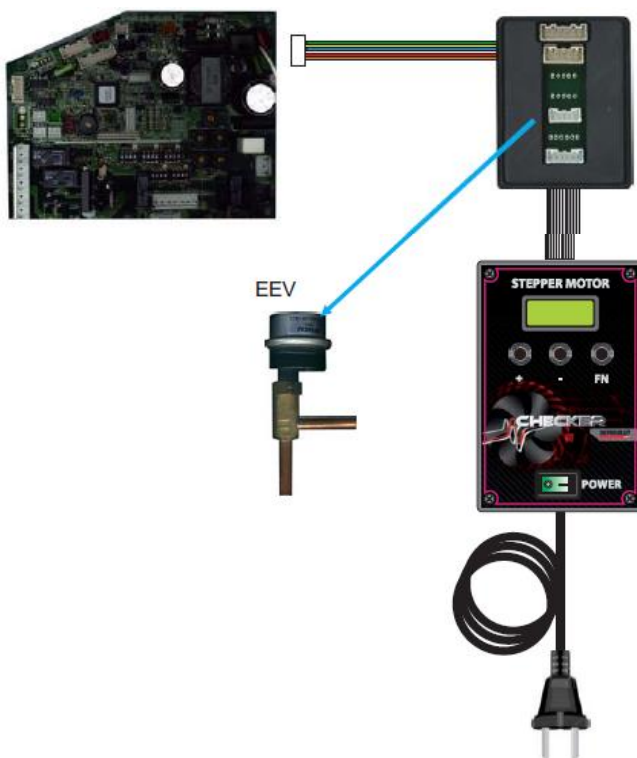


1. Testing and adjusting the position of stepper motors:

- Connect the stepper motor to the tester and turn on the main switch.
- Tester will automatically check all four motor windings. The result is displayed on the LCD display
- Press the button FN and select function TESTING.
- Use the buttons + and – to manually control motorized rotating in both directions (eg, close and opening EEV).

Check if the motor rotates correctly.

Control PCB



2. Monitoring the operation of stepper motors controlled by PCB unit:

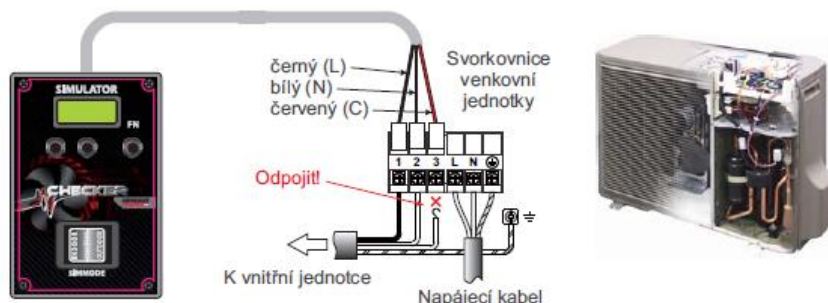
- Turn off power to the unit.
- Disconnect the stepper motor connector from PCB and connect instead the flat cable connector from the connector box.
- Cable of stepper motor connect to corresponding connector in connector box.
- Power on the unit and the tester.
- Press the button FN and select function MONITORING. On tester display can see and track the number of pulses of the stepper motor.

COMSIM

Simulator of indoor and outdoor unit, communication tester

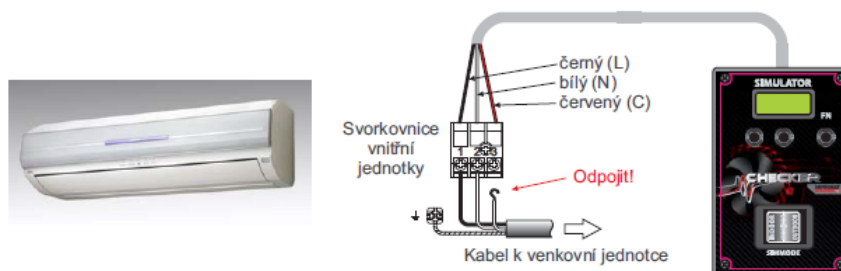
Testing inverter outdoor units by simulations of the indoor unit

- Turn off power supply of outdoor unit.
- From the terminal, designed for connecting cable, disconnect the communication cable.
- Connect the tester to the outdoor unit through a terminal intended for the connection cable.
- On the tester set the function switcher to INDOOR position.
- Turn on power of outdoor unit.
- Now the outdoor unit can be controlled using the tester



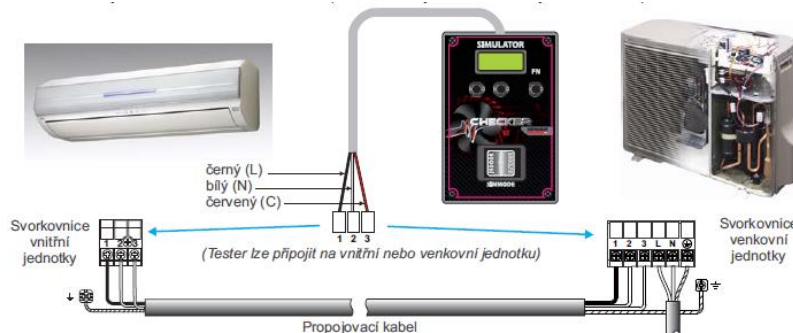
Testing indoor unit by simulation of outdoor unit

- Turn off power supply of outdoor unit.
- From the terminal, designed for connecting cable, disconnect the communication cable.
- Connect the tester to the indoor unit through a terminal intended for the connection cable.
- On the tester set the function switcher to OUTDOOR position..
- Turn on power of indoor unit.
- Now the indoor unit can be controlled using the tester



Monitoring communication between indoor and outdoor unit

- Turn off power supply of outdoor unit.
- Connect the tester to the indoor unit through terminals, designed to connect the cable.
- On the tester set the function switcher to MONITOR OUTDOOR position...
- Turn on power of outdoor unit.
- Now you can monitor the communication between the indoor and outdoor unit by PC program ATW-SW, connected to tester over the USB data cable or RS232 (status and error messages, system data).



COMTEST

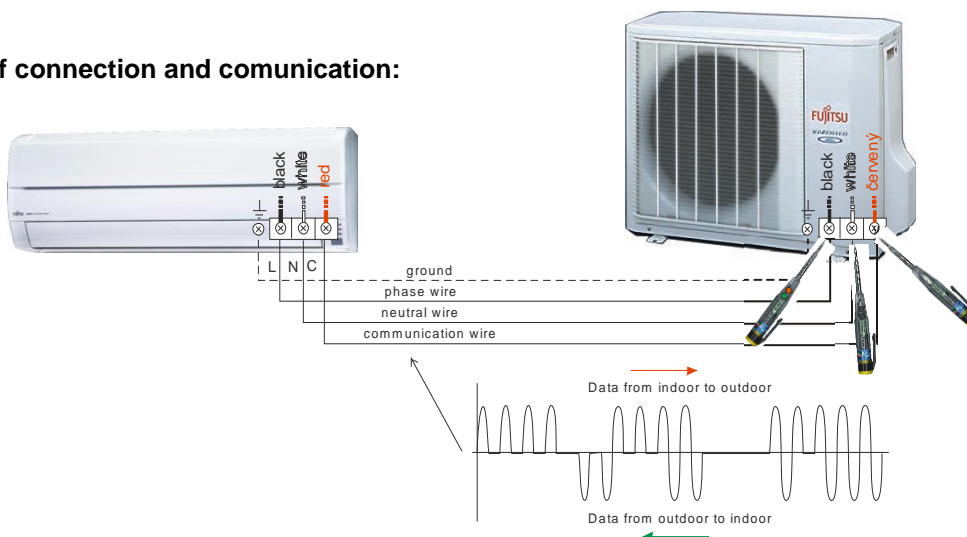
Tester of correct unit wiring and their communication

USED FOR TESTING:

- Connection of the supply supply.
- The correct cable connection.
- Communication between indoor and outdoor unit in the individual directions.
- The functionality of external outputs of modules ATW-C-xxx and ATW-EXP.



1. Test of connection and communication:



1. Connect the crocodile clip from tester to the ground terminal or ground of the indoor or outdoor unit.
2. Attach the probe tip to the testing terminal.
3. Watch glow of green and red LED:

N zero terminal (white wire from the terminal to the electronics of unit):

- LED is not lit

L phase (black wire):

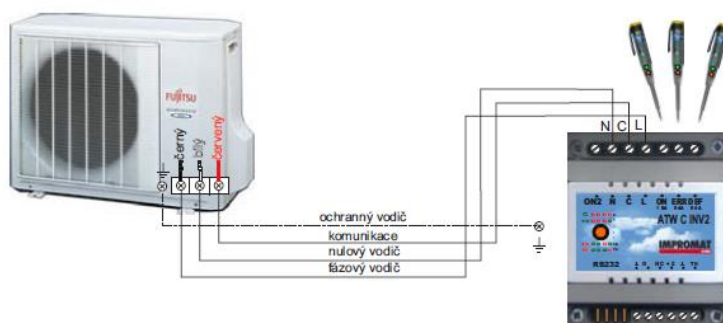
- Green and red LED lights continuously

C communication terminal (red wire):

- Flashing red LED: direction from inside to outside
- Flashing green LED: direction from outside to inside

2. Test of external outputs ATW-C-xxx (ON ERR DEF) and ATW-EXP:

according to the current output either of the LED is off, or both LED lights continuously. Another way of indication means the malfunction.



LOGGER

Recording device for communication data

This Logger is recording the data from communication between outdoor and indoor unit on SD memory card for future analysis.

There is a great opportunity use logger on site and leave him for necessary time to be able record the data when the error appears.



UPG Cable

Usb data cable for software (firmware) upgrade of tester modules.

No username and password needed

Direct updating via internet using a simple upgrade utility

